using the margin crenelation model to establish that they are not pahoehoe. Measurements of margin crenelations require flow margins to be sufficiently long, clearly exposed, **and unaffected by large-scale** topographic controls. Distal flow lobe measurements have to be made on slopes which are sufficiently steep relative to flow thickness (slopes > 0.5 degrees for the flows examined), to ensure that the dimensions of the distal lobes represent flow rheology rather than minor topographic irregularieties.

Major constraints and uncertainties: All models are based on the behaviour of terrestrial lavas and their application to martian flows assumes that flow emplacement and growth patterns are similar on Mars and Earth. The effects of the lower martian gravity are taken into account in the flow field growth model and the distal flow lobe model. So far, the only evidence that gravity is not affecting the outcome of the margin crenelation measurements is the agreement between these results with those obtained using other techniques (1,5). Another major uncertainty is how the erosion of flow margins can affect margin crenelations. We have examined a terrestrial basaltic flow to make a preliminary assessment of the effects of margin erosion.

Strengths: The application of several complementary models to the same extra-terrestrial flows can strengthen and test the conclusions drawn by the use of any individual method. The three models presented are particularly suited for the study of extra-terrestrial lavas using imaging data. Conclusions drawn from one **model can be tested by the use of another, thus reducing measurement uncertainties. Limitations of the applicability of a model can also be taken into account: for example, the margin crenelation model complements the flow field growth model, as it can identify pahoehoe flows for which the flow field growth model is not applicable.**

Conclusions: We have found the three models to give consistent results for all the flows examined. Flows on Alba Patera are of two types: 3 of the flows examined are consistent with basaltic aa, while 13 flows are consistent with a non-basaltic composition, though the possibility of eroded basalt cannot be completed ruled out. Flows on Elysium are consistent with basaltic composition and the margin crenelation results indicate both pahoehoe and aa types types are present.

REFERENCES: (1) Lopes-Gautier *et al.* (1995): ***LPSC XXV, 861-862.*** **(2) Lopes,** R.M.C. **and** Kilburn, C.R.J. **(1990):** *J. Geophys.* ***Res.*** **95, 14,383-14,397. (3)** Kilburn, C.R.J. and Lopes, R.M.C. (1991): *J.* ***Geophys. Res.*** **96, 19,721-19,732. (4) Bruno et al. (1994):** *Bull. Volcanol.* ***56, 193-206. (5)*** Bruno, B.C. **and** Taylor, G.J., Geophys. **Res. Lett.** ***22,*** **pp 1897-1900, 1995. (6)** Wadge, G. and Lopes, R. **(1991)** : *Bull. Volcanol.* ***54,*** 10-24. (7) Hulme, G. (1974) : *Geophys. J.* ***Royal*** *Astron.* ***Sot. 39, 361-383. (8)*** Kilburn, C.R.J. (1993): ***Active Lavas: Monitoring and*** *Control.* London: UCL Press, 263-280.